

PROJECT SUGGESTION ROUTING SHEET (PSRS)

For X-y Coordinate Reader  
Project Suggestion Title

Instructions:

a. At each numbered step a copy of the updated PSRS shall be sent to the Designee except in steps 10 and 11.

b. Use charge # <sup>99245-6</sup> ~~993701~~ when working on any Project Suggestion.

1. PSRS originated by Designee of Eval. Com. Chmn. on 13 June  
Date

2. To Eval. Com. Chmn. for Proceed/Stop decision by Committee

☒ Proceed

Date of decision 13 June

☐ Stop

3. To Assistant for Plans and Development for review

☐ Disagree - Proceed

Date of review \_\_\_\_\_

☐ Agree - Stop

4. To Eval. Com. Chmn. for assignment to Branch

Assigned to DB Branch; Date 13 June

5. To Assigned Branch Chief for Investigator assignment

Assigned to Mr. \_\_\_\_\_ on \_\_\_\_\_;

Investigation to be completed by \_\_\_\_\_

6. To Investigator to gather data and information

Investigation completed on \_\_\_\_\_

7. To Eval. Com. Chmn. (thru Br. Chief) for Recommendation

☒ Recommend Proceed; Project title X-y Coord Reader

\_\_\_\_\_ ; Assign to Dev Branch

☐ Recommend Stop

8. To Assistant for Plans and Development for decision

☐ Drop Project Suggestion

Date \_\_\_\_\_

☐ Originate Project

Signature \_\_\_\_\_

9. To Administrative Assistant for project number assignment

Project number \_\_\_\_\_ ; Date \_\_\_\_\_

10. To Designee for origination of PSRM

PSRM to originator and PSRM, PSF, PSRS copies to file

Date \_\_\_\_\_

11. To Assigned Branch Chief

CLASSIFICATION

WORKING PAPER

31 / MAY / 1966  
Date of Suggestion

PROJECT SUGGESTION FORM (PSF)

TO: Chairman, P&DS Project Evaluation Committee

1. Name of Suggestor [redacted] Location IAD/MEB 3N126

2. Brief Explanation of Need for this Improvement [redacted]

SEE ATTACHED PAPER

3. Brief Description of Suggestion (Use Reverse Side if Necessary):

SEE ATTACHED PAPER

*Proceed*  
*This concept is now included in the P&DS #7044 and #7295, it will also be included in the Digitized Meas.h.t. Table #*

DO NOT WRITE IN THIS SPACE

Selected Project Suggestion Title: X-Y Coordinate Reader

*To D.B. for investigation*

TOP SECRET

IP FM 294 (4-66)

WORKING PAPER

124

## WORKING PAPER

### PROPOSAL FOR DEVELOPMENT OF EQUIPMENT CAPABLE OF AUTOMATIC DETERMINATION OF PHOTO COORDINATES

submitted by



1. Thousands of photo coordinates are required for a variety of purposes from every [ ] mission. Automated techniques for obtaining these "X-Ys" would result in a substantial saving of photo analyst time and increased accuracy, thereby increasing productivity. In the Missiles/electronics Branch alone it is estimated that 1500 to 2000 manhours per year could be saved if the branch had this type of equipment readily available.

2. Currently photo coordinates are obtained by using the Universal Grid No. 1 which is graduated in centimeters from 0 to 92 in the X direction and from 0 to 24 in the Y direction. Standard use of this grid is such that the center fiducial mark of a frame or the referenced index mark always has an X value of 42.0. The edge of the photo image adjacent to the fiducial mark or index also has a constant Y value; for KH-4 material this value is 14.8 and for KH-7 material it is 23.1.

3. It would be a relatively simple procedure to modify a [ ] 10" light table to produce these photo coordinates automatically. A resettable counter that registered movement of the carriage in the X and Y directions in millimeters (tenths of a centimeter) would form the basis for this equipment. For camera systems currently in use, the glass surface of the light table would be scribed with three dots. These dots would be used as a reference point over which the edge of the photo image adjacent to the center fiducial would be placed when using KH-4 material, or the edge of the image adjacent to the index mark would be placed in the case of KH-7 material. A line, movable in the Y direction, running the entire length of the table would be desirable in order to insure that the frame of photography was aligned straight across the table. A glass pressure plate should be installed to hold the entire frame firm. When the scope, which would be mounted on a carriage so as to move only in the X and Y directions, was placed over the correct dot (using a cross hair indicator) the counter could be reset to the proper value and all coordinates would be in reference to this position. As long as the same type of film was being used and each subsequent frame was properly positioned over the proper reference dot, it would be unnecessary to reset the counters.

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Approved For Release 2005/05/02 : CIA-RDP78B04770A002200010019-8

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Because of the normal positioning of KH-4 Aft camera photography on a light table, a counter reverse switch would be necessary to give proper coordinates. A two-position toggle switch would suffice with one position being marked for KH-4 Fwd and KH-7 photography and the other marked for KH-4 Aft material.

4. When photo coordinates are to be used for ordering materials from the photo lab a third value is highly desirable. This is a rotation angle which indicates the desired position of the printing easel to produce the best composition for a given enlargement. A counter registering in degrees the rotation of the scope head from the Y axis is all that is needed. Values of 0 to 90 degrees right and left of the Y axis would be sufficient. All of these values, X,Y and rotation would be visually presented on an easily read panel.

5. To further assist in ordering photographic materials from the lab it would be very useful to have in the optics of the scope a grid indicating area coverage for typical enlargement factors when printed on standard sizes of paper. If this capability was put into the eyepiece then a fixed magnification scope would be necessary. A suitable magnification for most purposes would be 10X.

6. A logical extension of this piece of equipment would be the matching of it to a Flexowriter so as to automatically receive printouts of photo coordinates and other data. These printouts could contain sufficient information to be forwarded directly to the lab as photo orders. A punch tape could be sent with the order if a machine was developed to automatically produce enlargement friskets. These friskets could have much more information on them than is currently available and this in itself would save a great deal of analyst time as photo labels would no longer have to be individually produced by hand.

7. This discussion is by necessity very general and undoubtedly there are details and problem areas not covered. It is suggested that further investigation into this type of equipment be carried out as soon as possible by Plans and Development and that the details be closely coordinated with image analysts in IAD and PAG as work progresses.

8. Included as attachments to this paper are three rough drawings indicating an initial concept for the design of this equipment.

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**SECRET**NPIC/P&DS/D/6-1472  
15 July 1966

MEMORANDUM FOR: Chairman, Project Evaluation Committee

THROUGH: Chief, Development Branch, P&DS *WJ*

SUBJECT: Project Suggestion No. 124, X-Y Coordinate Reader

1. The Imagery Analysis Division has submitted a project suggestion entitled "Proposal for Development of Equipment Capable of Automatic Determination of Photo Coordinates." Attached is a copy of this proposal.

2. This memorandum contains the DB/P&DS evaluation of this suggestion and offers some recommendations about possible courses of action.

3. The proposal reflects a genuine requirement within the Imagery Analysis Division. Although it is submitted by personnel of the Missile-Electronics Branch of IAD, this requirement is valid for the other three branches also. If this equipment were to be obtained, it would undoubtedly have application within the Photographic Analysis Group as well.

4. There are two possible ways to solve the problem. One would involve the modification and application of existing devices and the other would involve a complete design and development of a specific device to do the job.

5. Some of the existing devices which are adaptable to IAD requirements are described below along with some of their inherent advantages and disadvantages for this particular application.

1. ☐ Variable-Width Film Reader - We have one of these currently in-house with a production model due for delivery in February 1967. This is a large piece of equipment which can provide most of the features asked for without modification. It was designed for similar but not identical applications in another Division. However, it has met with considerable user resistance due to some of its inherent functional deficiencies and due to lack of adequate operator training along with the natural initial reactionary response to a massive, complex, computer-like device being substituted for the "good old light table and stereomicroscope." These are some of the reasons the IAD people also take a dim view of this particular device.

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GROUP 1  
Excluded from automatic  
downgrading and  
declassification

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2. [ ] General Measurement Research Inc., "DIG" - This system is, to quote the manufacturer, "a long travel, ultra-precise, absolute reading, digital, linear measuring instrument." "DIG" for short. Basically it is a high resolution linear measuring device which can be used in many ways. It is readily adaptable to the IAD requirement and can be used with existing light tables with some modification. It offers a closely parallel solution to that suggested in the IAD proposal. This should encourage ready acceptance and use by these people if this particular device were selected as a solution to the problem.

3. [ ] Light Table Reader - This device is being used at the Army Personnel Research Office and produces X-Y coordinate readout from visual photography. It is basically a gear driven device with manual positioning of the tracking carriage. The entire tracking assembly is adapted to the [ ] 940 light table and is independent of the regular microscope carriage assembly. The general design concept of this device is very close to what IAD requires but there would have to be quite a bit of engineering re-design and refinement to adapt it to the IAD requirement.

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4. Based on engineering evaluation of the above mentioned equipment and discussion with IAD personnel, it is recommended that: (1) This proposal be accepted as a project, (2) The [ ] "DIG" system be adapted to a [ ] light table to meet the IAD requirement.

25X  
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6. We feel that the "DIG" system offers the quickest and most practical solution to the IAD problem. Because it is an on-shelf read-out system, it will also be more economical than the approach of designing and developing a device from the ground up. The possibility of putting the equipment on line should be investigated at an early stage in the project.

[ ]  
Development Branch, P&DS

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Attachment: As Stated

Distribution:

Orig. & 1 - Addressee  
1 - Ch/DB  
3 - DB/P&DS

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